

Claims

[c1] An information processing device comprising:
a data table having at least one first item data, each of
the at least one first item data having a corresponding
second item data, each of the at least one first and sec-
ond item data registered;
a pointer table having pointers to the registered data in
said data table, said pointers referenced in storage posi-
tions, said storage positions designated by hash values,
said has values obtained by applying a predetermined
hash function to the at least one first item data; and
a member selected from the group consisting of regis-
tration means and retrieval means, said registration
means comprising a means for implementing a regis-
tration for said at least one first item data and correspond-
ing second item data in said data table and said retrieval
means comprising a means for implementing a retrieval
of said second item data from said data table when said
first item data is retrieved, said registration means and
said retrieval means capable of being disabled by a syn-
onym,
wherein said hash function comprises a first and a sec-
ond hash function and said pointer table comprises a

first and second pointer table accessed using hash values derived from said corresponding first and second hash functions.

- [c2] An information processing device according to claim 1, wherein said registration means and said retrieval means uses said first hash function and said first pointer table when enabled and said second hash function and said second pointer table when disabled.
- [c3] An information processing device according to claim 1, wherein each of the registered data in said data table is designated by a pointer that is accessed by at most one of said first and second pointer tables.
- [c4] An information processing device according to claim 1, further comprising a selection table having selection data, said selection data identifying which of said first hash function and said first pointer table and said second hash function and said second pointer table are selected, said selection table used when searching through the respective registered data in said data table.
- [c5] An information processing device according to claim 1, wherein said registration means implements the registration of said first item data into said data table using said first pointer table, said registration means verifying

that said first item data is not registered in first pointer table or the second pointer table.

- [c6] An information processing device according to claim 2, wherein a synonymous first item data shares a pointer in said first pointer table with said registered first item data, said registration means using said second pointer table to register said synonymous first item data, said registration of said synonymous first item data not affecting the storage position in said data table of said registered first item data, said second pointer table having a pointer designating said storage position of said synonymous first item data.
- [c7] An information processing device according to claim 1, wherein the said registered first item data and said synonymous first item data share a pointer in said first pointer table, said registration means allowing a predetermined number of registrations, said registration means causing all additional synonymous registrations to be registrations in the second pointer table once the predetermined numbers of registrations into the first pointer table are exceeded.
- [c8] An information processing device according to claim 1, wherein said registration of said first item data and corresponding second item data includes a sender address

in a packet or frame received by the device and corresponding port identification data, and said retrieval of said first item data and corresponding second item data includes a destination address of said packet or frame and corresponding port identification data.

- [c9] An information processing device according to claim 8, wherein said sender and destination addresses are MAC addresses, and the device functions as a switch device that transfers the received packet or frame from a corresponding port to the destination MAC address in said received packet or frame.
- [c10] A data structure comprising:
 - a data table where first item data are registered, each first item data having a corresponding second item data;
 - a first pointer table where pointers to a first part of the registered data in said data table are registered in storage positions that are designated by hash values obtained by applying a first hash function to the first item data;
 - a second pointer table where pointers to a second part of the registered data in said data table are registered in storage positions that are designated by hash values obtained by applying a second hash function to the first item data of the other registered data; and
 - a selection table where selection data representing which

of said first and second pointer tables is used for searching through the registered data in said data table.